Mechanical Reduction Equipment: Case Studies

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Reduction is not a new issue ...

Vertical Cutters

- 0.5 – 5.0 ac/hr
- 51 sites, 10K acres

- Max dia. 8” to 10”
- Coarser fuel dist.
- 25 hp/ft. of cut

Site 1

Tires vs. tracks

- Herp survey
- Machine data
- Veg survey

20 ac

- Treated 2000
- Burned 2001

Kisatchie Nat'l Forest

Gyro-trac GT-18

- 8’ cutting width
- 190 hp
- 2.0 psi
- Rotary mower, Toma-Ax, ROWMEC

Production

- Daniel Boone 12,000 tpa 1.8 ac/PMH
- Francis-Marion 1,000 tpa 1.6 ac/PMH
- E. Canada 8,000 tpa 0.7 ac/PMH
- Kisatchie 0.8 ac/PMH

www.gyrotrac.com (GT-18)

www.kmc-kootrac.com (1100H)

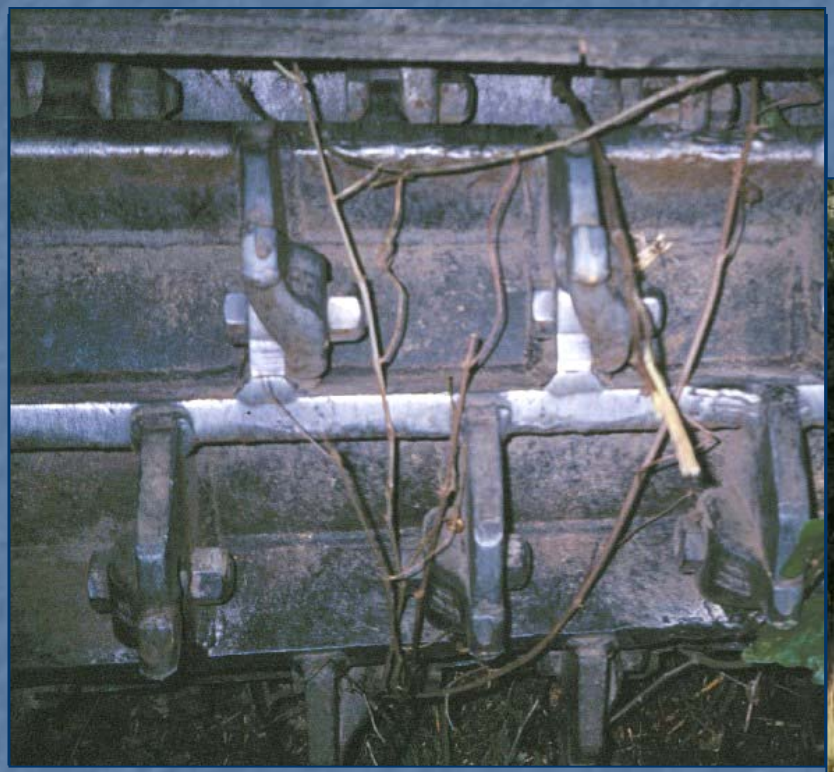
www.fecon.com (RT-350)

Site 2

Re-introduction of Rx fire

- Machine data
- Veg survey
- Fire re-intro

Cutterheads



Trafficability

Ft. Benning, GA

Miscellaneous Reduced Material

Magnum 500

- 500 hp
- 50,000 #
- Sliding head
- Max. cut 30”

www.magnummulcher.com


10:33:21AM
SEP 27 2000

Delta 953C/450

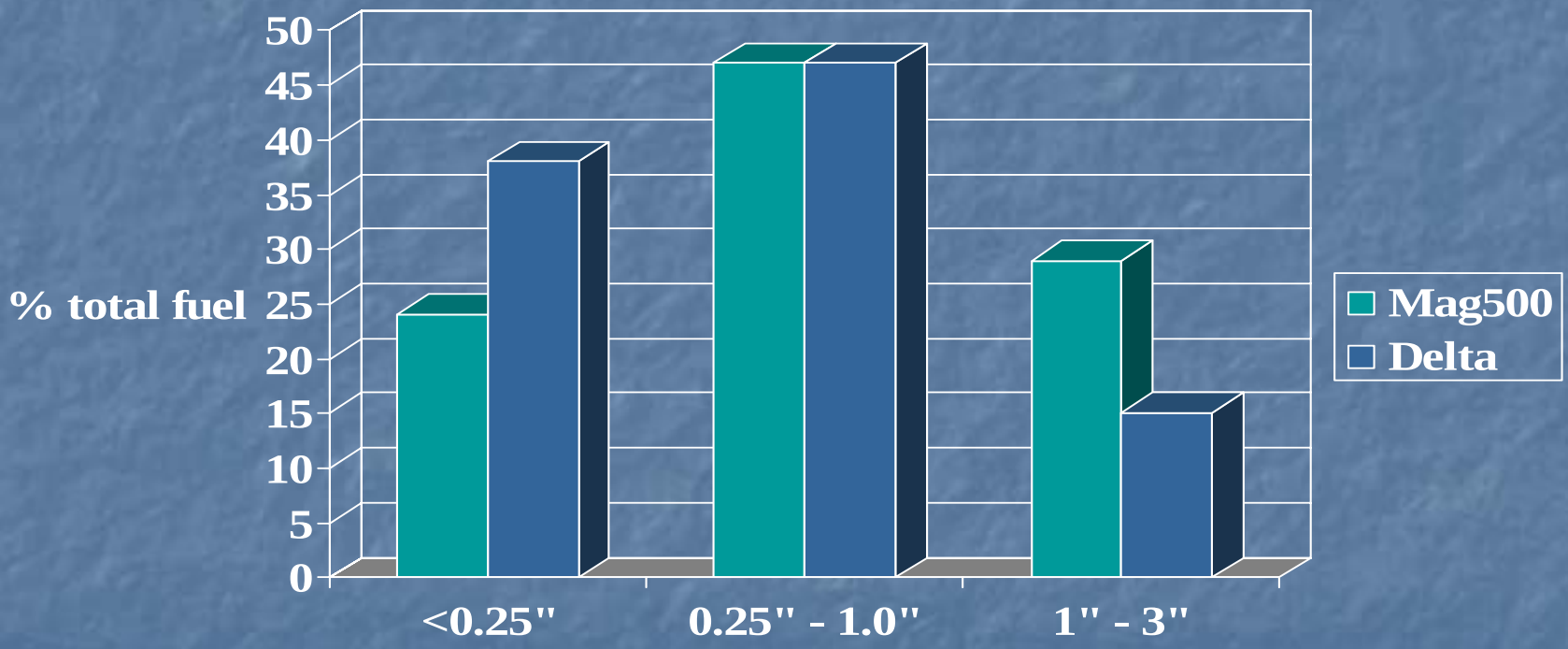
- 450 hp
- 25 tons/hr
- 32” pads

High HP Machines

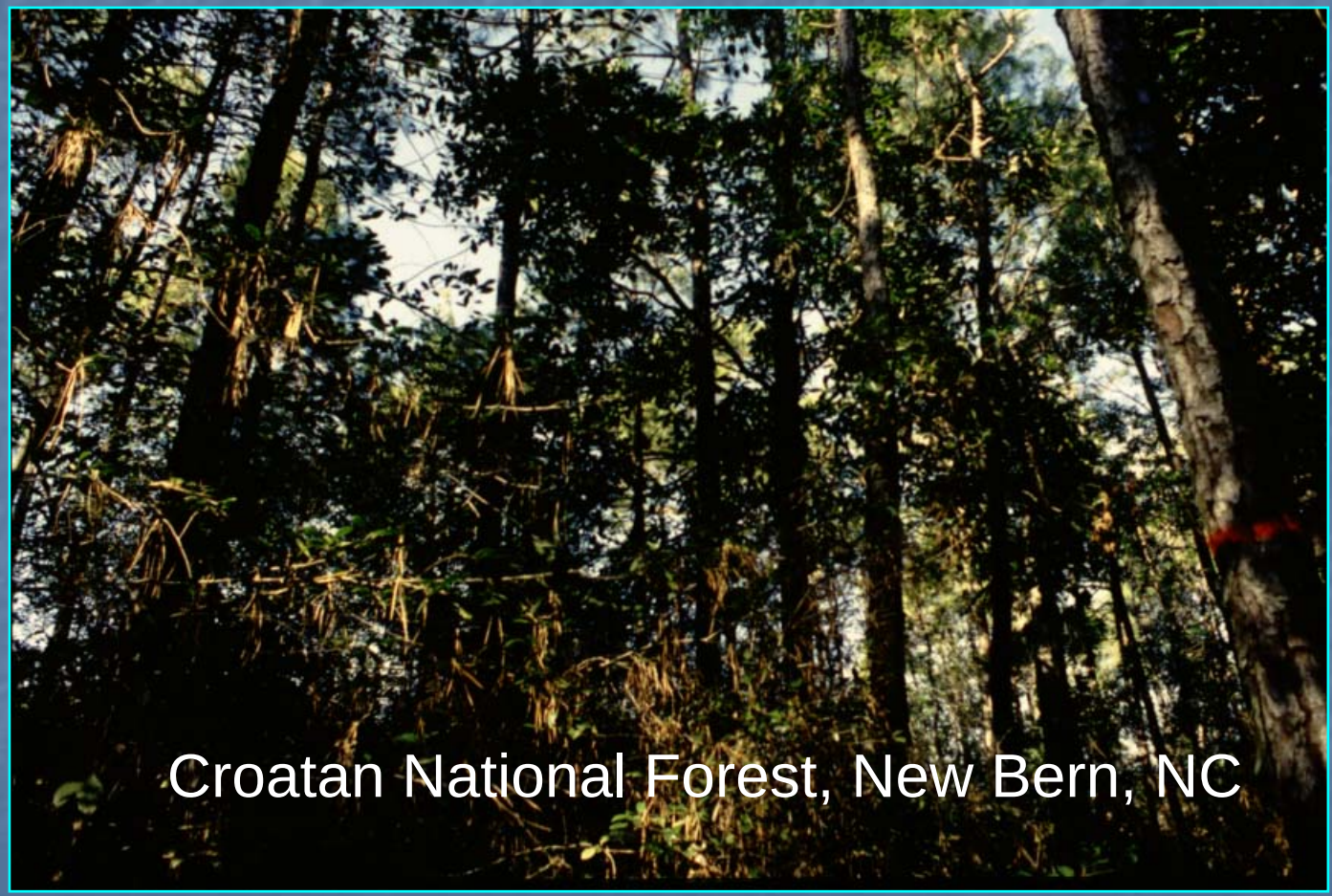
- Magnum 1.0 ac/hr
- Tigercat www.tigercat.com
- Franklin www.franklin-treefarmer.com
- Delta www.deltamp.com
- Supertrak www.supertrak.com
- Fecon www.fecon.com

Fuels

Fuel Size Distribution

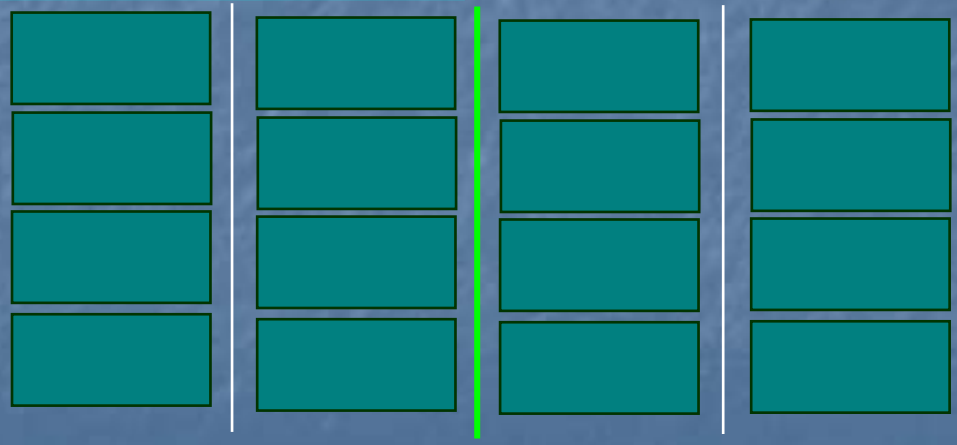


Site 3



Boom vs. Direct

- 0.24 – 0.78 ac/hr



- 0.52 – 1.59 ac/hr

Dense Residual Open Residual

Croatan NF Post

Shinn SC-1

- 220 HEX
- 240 hp
- 36” wide
- .2-.8 ac/hr

Boom-mounted Horizontal

- Shinn cutters (.2 - .8) ac/PMH
- Denis (4700 – 12500 tpa) .35 - .5 ac/PMH
- Alamo FMH
- Seppi M
- Brown Brontosaurus
- Etc. pp. 72 - 78

Site 4: Fireline Clearing

- 0.5 – 0.7 ac/hr
- ~2000’/hr @ 20’ clearing

Atlanta, (Idaho)

Site 5: Nutrient Cycling

- Control, shred, subsoil
- 0.15 – 0.65 ac/hr

Production Summary

- 0.2 – 1.6 ac/PMH
- Production cut in half in rough terrain
- Trafficability critical
- Rubber tires > Tracks > Booms
- Vertical shaft > Horizontal shaft
- Method is critical

Productivity is affected by ...

- Spacing of residuals
- Operating pattern
- Terrain
- Operator experience and motivation
- Machine type
- Method of operation

Highest productivity ...

- Fast machine
- On flat (<15%?) ground
- Residual spacing >15’
- Few large diameter stems to remove
- One-pass treatment
- With a tailwind

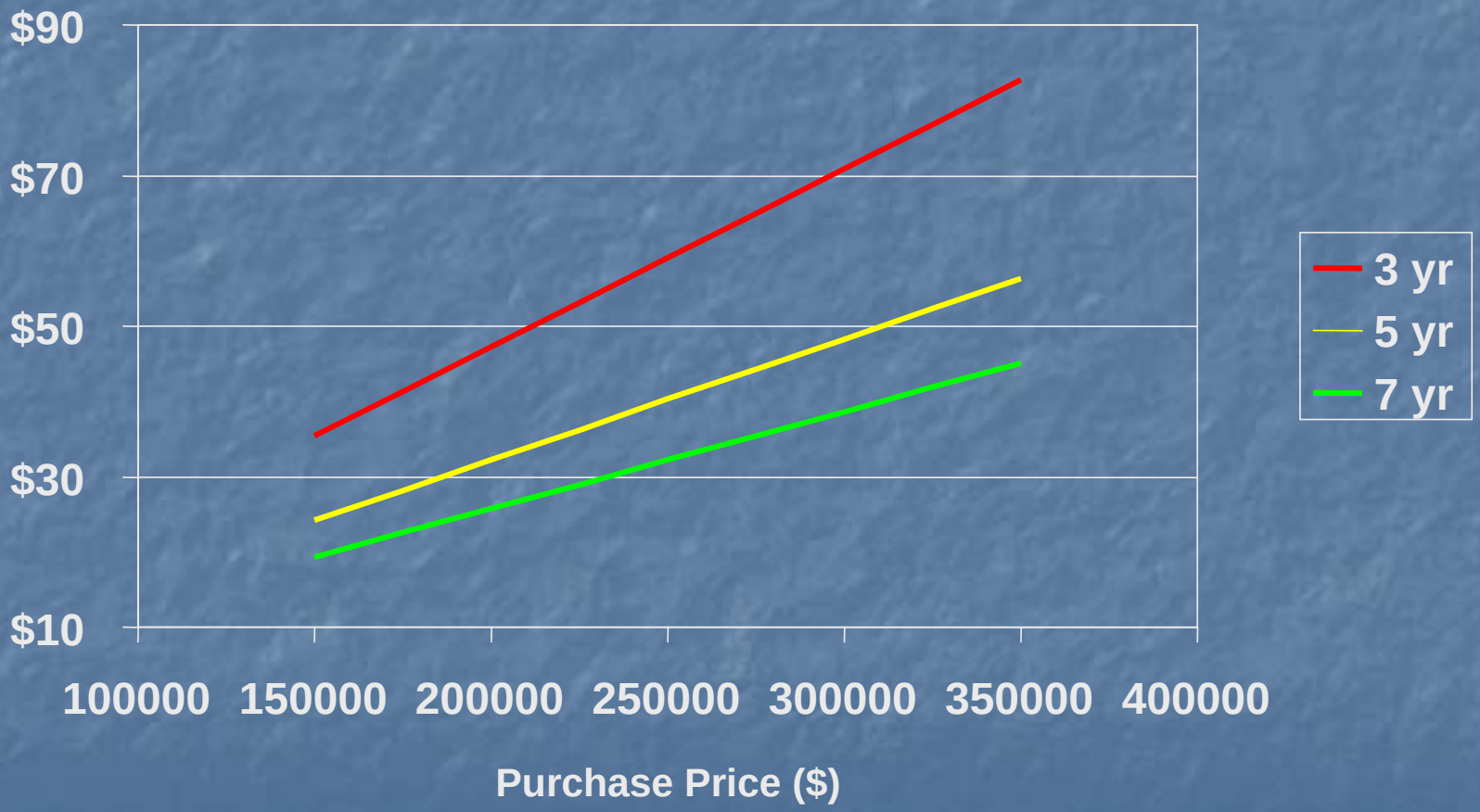
Gimme a number ...

- Vertical cutter: 2.0 ac/hr
- Horizontal cutter: 1.0 ac/hr
- Boom-mounted: 0.7 ac/hr
- Steep ground: Divide by 2
- Multi-passes: Divide by # of passes
- Volume >25 tons/ac: adjust

Costs

- Ownership costs: (5 yr, 20% salv)
  - Annual depreciation, IIT

Effect of machine life



Costs

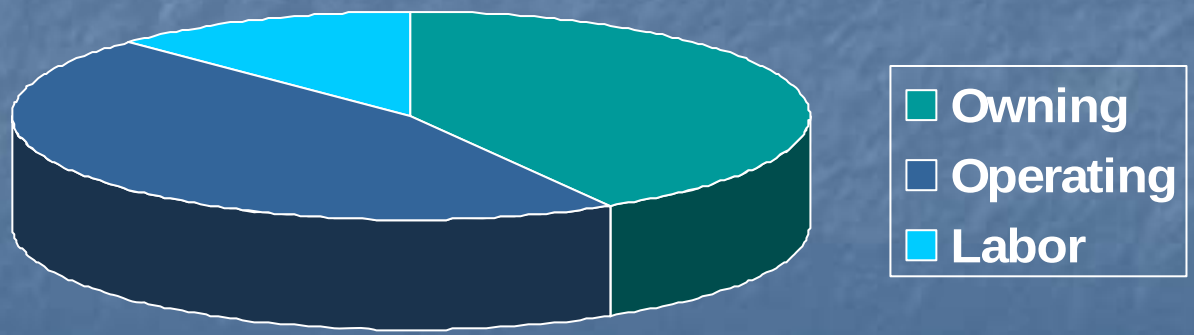
- Operating costs
  - Fuel @$1.40/gal * 14 gph = $19.60/hr
  - Lube (40% of fuel) = $7.85/hr
  - Teeth (300 hr life) = $9/hr
  - Tires (5000 hr) = $2/hr
  - Repair & Maint = $15-20/hr

    TOTAL OPERATING ~$55/hr

Total Machine Cost

- Owning: $50/hr
- Operating: $55/hr
- Labor: $15/hr

$120/hr



Other Cost Factors

- Move-in: $500-$1000
- Overhead: 20%
- Profit: 10%
- Risk

$130 - $255/hr?

On a per acre basis ...

- $255/hr, 0.2 ac/hr = $1275/acre
- $255/hr, 0.7 ac/hr = $365/acre
- $130/hr, 1.0 ac/hr = $130/acre

Fireline maintenance

- Units < 0.5 acre cheaper to clear
- What are you paying for?
  - Defensible boundary
  - Prescribed fireline

Subsequent treatments

- Herbicide, re-mowing, rx fire
- Compare mgmt regimes over time

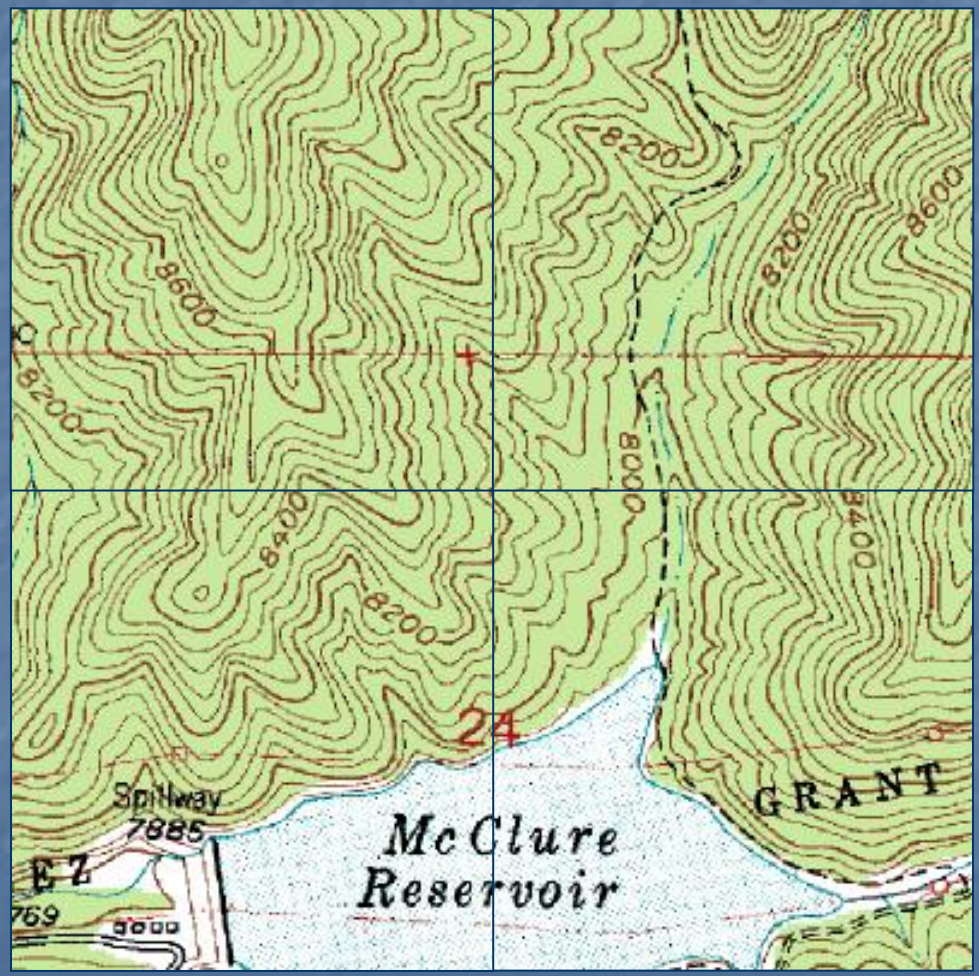
Why are costs so high?

- High horsepower machines
- Short-term jobs
- Opportunity costs
- Lack of experience with treatments
- Lack of experience with machines
- Who are the contractors?
- $300 toilet seat

What can we do to keep costs down?

Strategic Planning

- Where
- Volumes
- Partition mat'l
- Slope? Soils?
- Select a tool



Project Planning

- Clearly define desired fuel outcome
- Avoid tight stands
- Avoid over-treatment
- Avoid “parking” it out